Abstract:

The bulge region of the hair follicle has been reported as a putative source of hair follicle stem cells (HFSC) for many years. The differentiation of Hair Follicle stem cells (HFSCs) into neurons and glial cells represents a promising cell-based therapy for neurodegenerative diseases. In the present study, was evaluated for new methods that might influences neural differentiation of HFSCs.

Bulge stem cells were isolated and cultured in DMEM/ F12. In this study, cytotoxic effects of all trans retinoic acid (ATRA) were evaluated. Cell survival was evaluated using MTT and acridine orange/ ethidium bromide (AO/EB) assays. In the present study, we compared the effects of ATRA, serum free, other chemical compounds treatmentsupon neuronal and glial differentiation of HFSCs. Subsequently, immunocytochemistry were also employed to detect expression of a neural stem cells marker (MAP2), and a glial marker (GFAP).

Results showed that apoptotic cells in hair follicle stem cells caused by 10 μM and higher doses of retinoic acid.The IC50 value determined by the dose response curve was found to be 14.3±0.6 μM. In this study, $CD34^+$ HFSCs were isolated, and these cell formed clonies in vitro. In addition, among the media tested both 1 μM of ATRA and serum free supported the neural differentiation most effectively. Furthermore, inserum free medium, glial cells were seen.

The findings indicate that if the hair follicle stem cells exposed to high doses of all-trans retinoic acid, the cells may be undergo apoptotic cell death the HFSCs are heterogeneous cell populations expressing cell-surface markers for stem cells. Also, lower concentration of ATRA(1μM) and serum free media induced neural differntiation and we propose that this type of neural induction approaches, would make an excellent model for neural induction of HFSCs.

Key word : hair follicle , stem cells , bulge region , differentiation , CD34, neurons and glial cells